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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,709	01/09/2002	Kuo-Yu Chou	67,200-603	6454
7590 05/18/2004				
TUNG & ASSOCIATES Suite 120 838 W. Long Lake Road Bloomfield Hills, MI 48302			EXAMINER LE, THAO X	
			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/043,709	Applicant(s) CHOU ET AL.	
	Examiner Thao X L	Art Unit 2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 May 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 29-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-28 are cancelled.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 29, 31 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pub 2002/0084516 to Efland et al.

Regarding claim 29, Efland discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device in fig. 1 comprising the steps of: initially providing a substrate p sub thereafter configuring substrate to comprise a wiring bond pad 160 comprising only a single metal layer 162, fig. [0050], wherein single metal layer comprises a layer a layer comprised of only one type and does not share layer with any other material, thereafter positioning at least one IC device 120 [0042] below wiring bond pad 160 to thereby conserve IC space and improve wiring bond pad efficiency as a result of configuring wiring bond pad to comprise a single metal layer, thereafter locating a buffer 163 and bonding layer 165 immediately above single metal layer 162; thereafter locating single metal layer 162 above a plurality of intermetal dielectric layer (IMD) 1312/134 [0043] and thereafter locating at

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least one IC device 120 below plurality of layer IMD, wherein single metal layer comprises a metal-8 layer 162, thereby preventing a wiring bond stress-induced fracture in wiring bond pad.

Regarding claim 31, Efland discloses the method wherein the metal-8 layers 162 comprising a copper layer [0050].

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 30, 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pub. 2002/0084516 to Efland et al.

Regarding claim 30, Efland does not expressly disclose the IMD layer comprises at least IMD-1 to IMD-7 layers.

However, Efland discloses the method comprises plural IMD layers 131/134. In addition, such multilayer of IDM is also being disclosed in US 6625882, column 1 lines 15-25. Accordingly, it would have been obvious to one of ordinary skill in art to use plural IMD layers teaching of Efland in the number of layer as claimed, because it has been held that where the general conditions of the claims are discloses in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 32, Efland discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device comprising the steps of: providing a substrate P sub, thereafter configuring substrate to comprise a wiring bond pad 160 to comprises a single metal layer 162, wherein single metal layer does not share single metal layer with any other material, thereafter locating at least one IC device 120 below wiring bond pad 160, to thereby conserve IC space and improve wiring bond pad efficiency as a result of configuring wiring bond pad to comprise a single metal layer 162, thereafter locating a buffer 164 and bonding layer 165 immediately above single metal layer 162; thereafter locating single metal layer 162 above a plurality of IMD layers 131/134, and thereafter locating at least one IC device 120 below plurality of IMD layers, wherein single metal layer comprises a metal-8 layer of copper [0050], thereafter forming a layer of metal layer 164 [0052] above single metal layer 162 comprises a buffer 164 and bonding layer 165, thereby preventing a wiring bond stress-induced fracture in wiring bond pad 160.

But Efland does not expressly disclose the metal layer 163 comprises aluminum.

However, Efland discloses layer 164 is a metal stress-absorbing layer comprises nickel [0052]. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to replace the copper stress absorbing teaching of Efland with aluminum, because the metal teaching of Efland would have included copper or aluminum and it would have provided the same stress-absorbing function.

The recitation of 'preventing a wiring bond stress-induced fracture in wiring bond pad' is only a statement of the functional properties of the bond pad. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Regarding claims 33-38, Efland discloses the metal film 164 formed above single metal layer 162 having a thickness in a range of  $10\text{KA}^\circ$ - $50\text{KA}^\circ$  [0052] and wherein the single metal layer 162 comprises copper layer having a thickness of approximately  $2\text{-}5\text{KA}^\circ$  [0050]. Accordingly, it would have been obvious to one of ordinary skill in art to use the metal stress absorbing layer teaching Efland in the range as claimed, because it has been held that where the general conditions of the claims are discloses in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 39-40, as discussed in the above claims 29-38, Efland discloses all the limitations of claims 39-40.

***Response to Arguments***

7. Applicant's arguments with respect to claims 29-40 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thao X. Le  
14 May 2004



LONG PHAM  
PRIMARY EXAMINER